

Figure 1

Configuration of Telcordia's GR-303 Specification

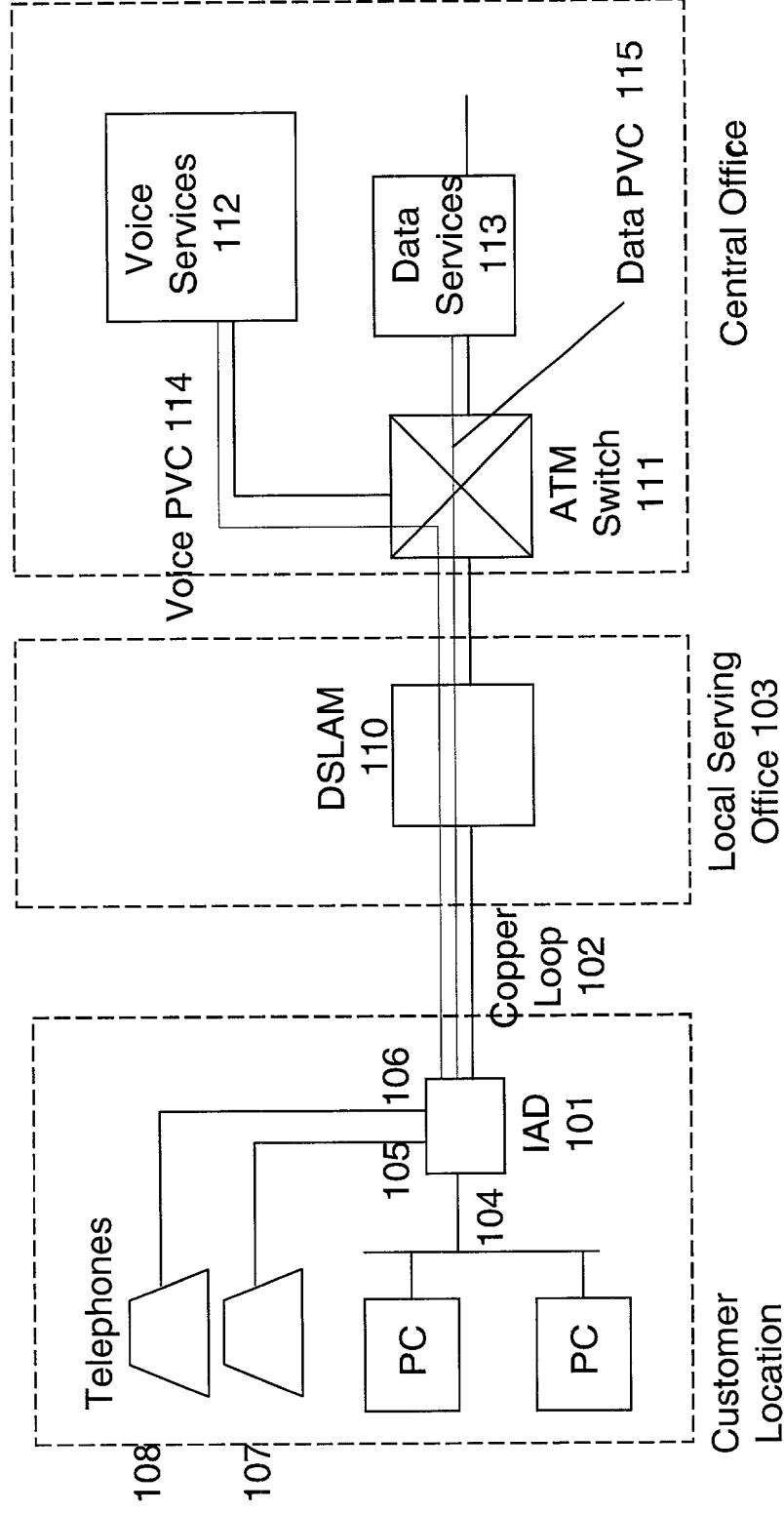
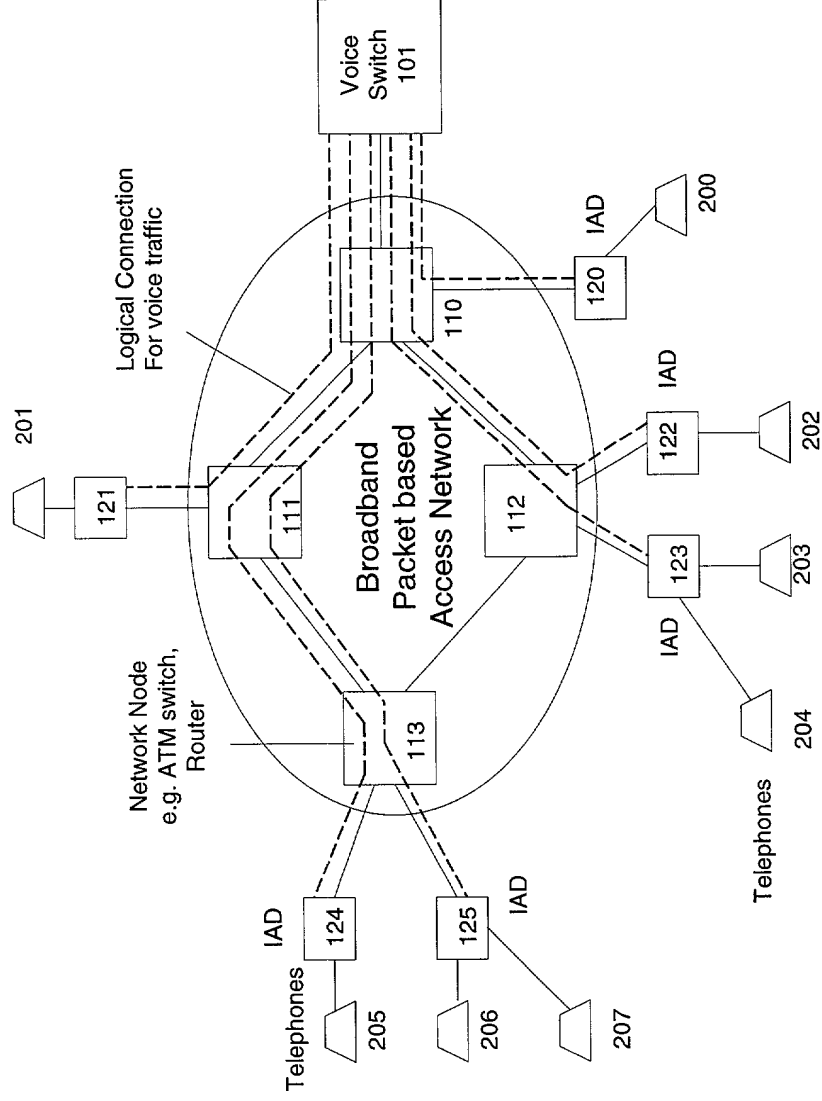
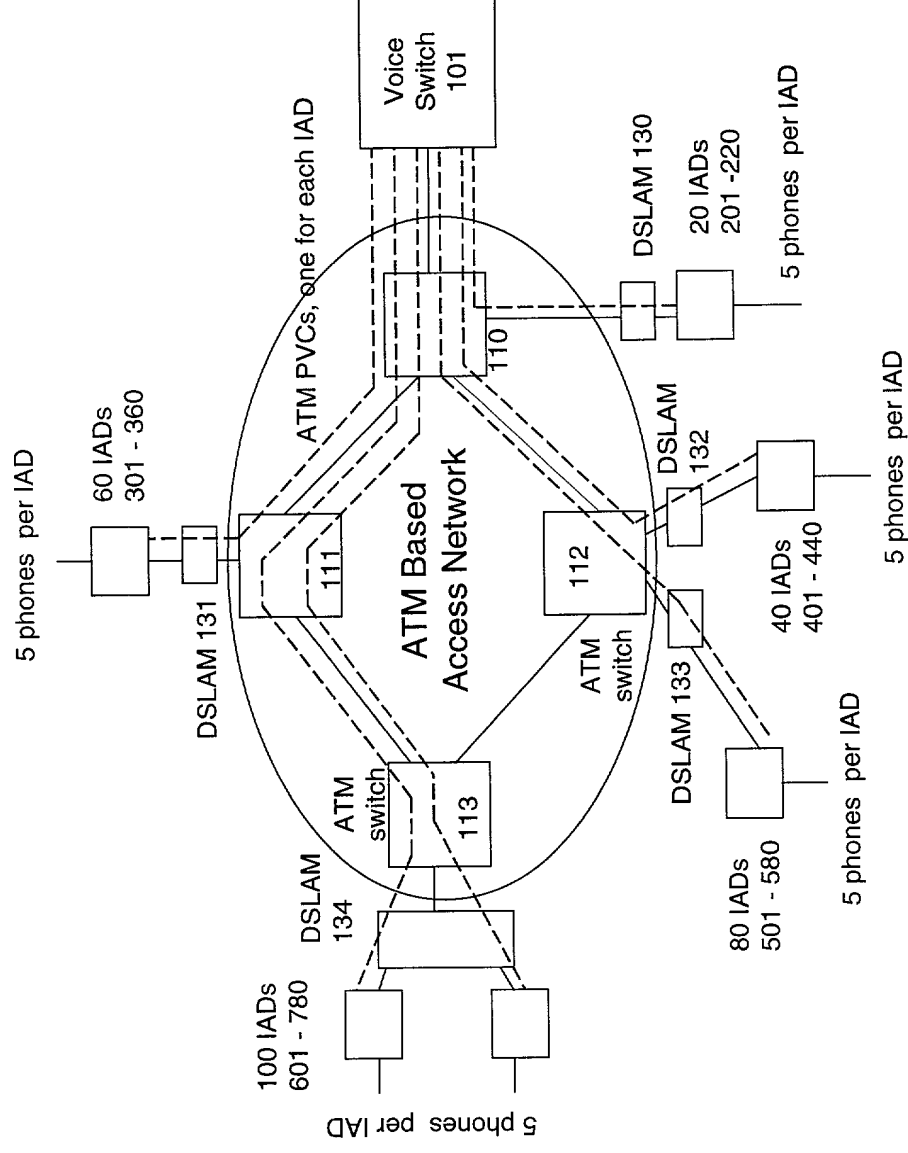


Figure 2  
Typical DSL Access Arrangement



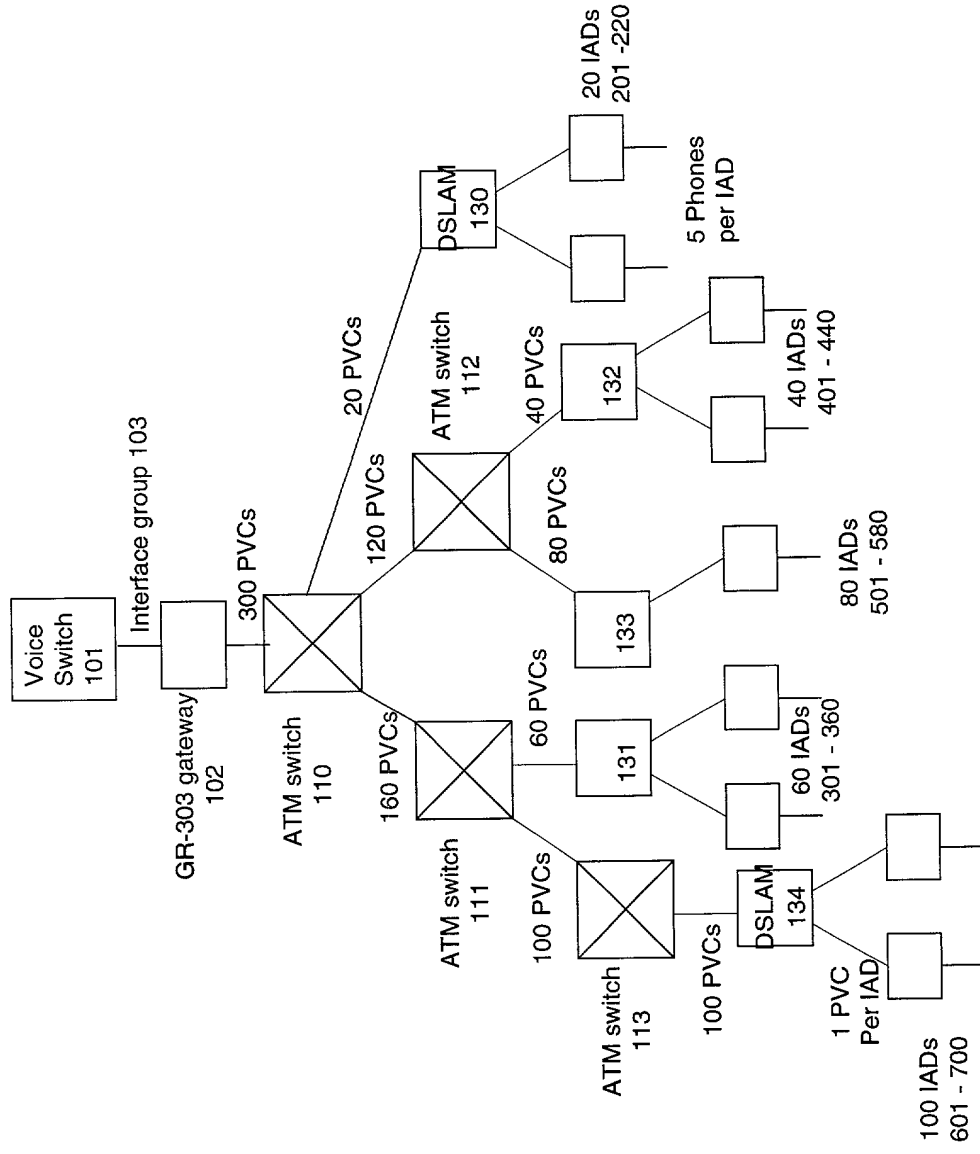
**Figure 3**

Example of a Network of IADs Connected to a Voice Switch.



**Figure 4**

Example of DSL Access to Class 5 Voice Switch via GR-303 Gateway



**Figure 5**

Tree Structure of the Network in Figure 4



VP Segment	End points		Number of PVC in segment	Number of phones supported	IADs supported
309	DSLAM 134	Switch 113	100	500	601 - 700
306	DSLAM 131	Switch 111	60	300	301 - 360
307	DSLAM 133	Switch 112	80	400	501 - 580
308	DSLAM 132	Switch 112	40	200	401 - 440
303	DSLAM 130	Switch 110	20	100	201 - 220
305	Switch 113	Switch 111	100	500	601 - 700
302	Switch 111	Switch 110	160	800	601 - 700; 301 - 360
304	Switch 112	Switch 110	120	600	501 - 580; 401 - 440
301	Switch 110	Voice Switch 101	300	1500	All

Figure 7

Characteristics of the VP segments of the Tree Structure in Figure 6.

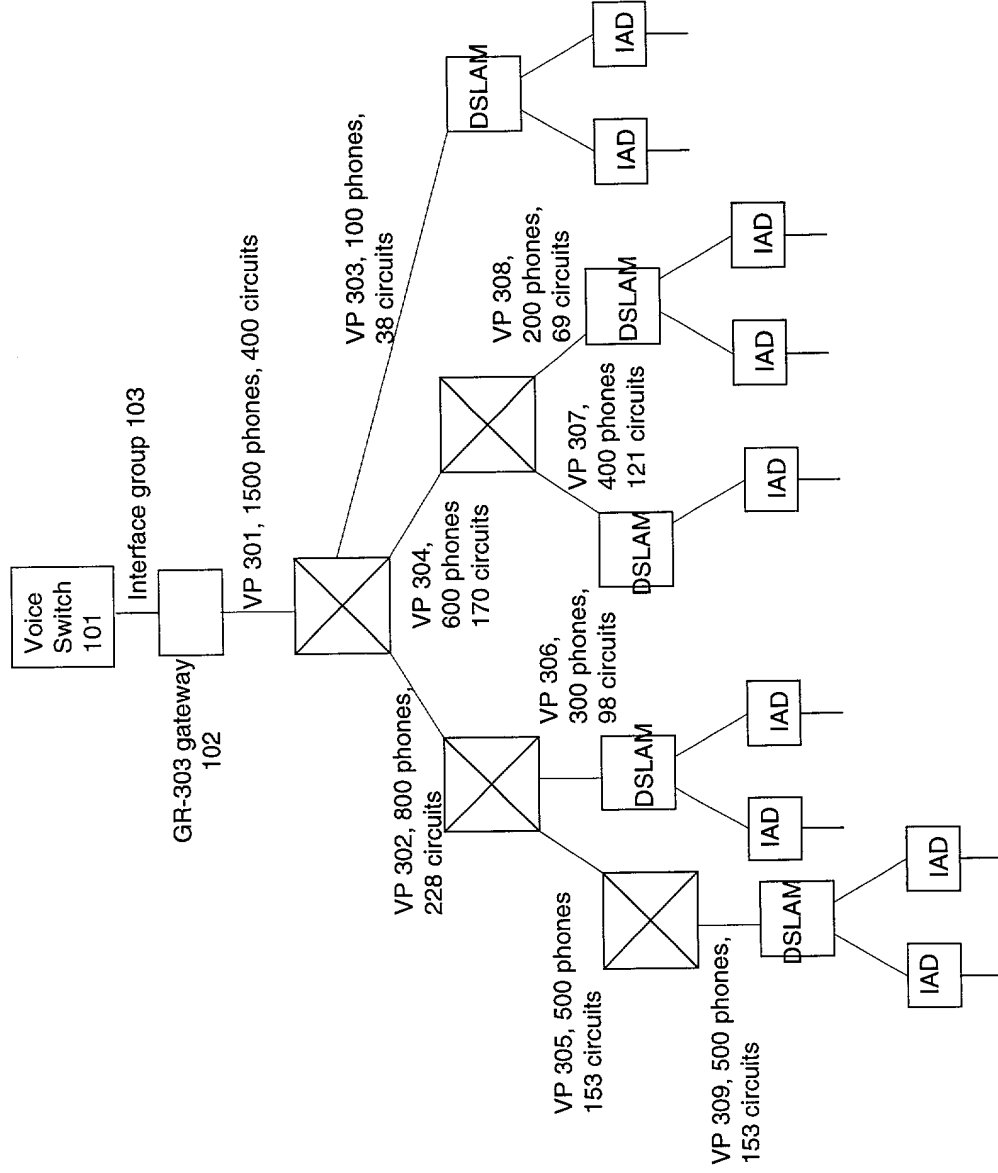
VP segments	Number of Phones	Busy hour Traffic load <sup>(a)</sup>	Blocking Probability <sup>(b)</sup>	Circuits Required <sup>(c)</sup>	Equivalent bandwidth
301	1500	375 erlangs	1 %	400	32.8 Mbps
302	800	200 erlangs	.5 %	228	18.70 Mbps
303	100	25 erlangs	.5 %	38	3.12 Mbps
304	600	150 erlangs	.5 %	170	10.94 Mbps
305	500	125 erlangs	.2 %	153	12.55 Mbps
306	300	75 erlangs	.2 %	98	8.04 Mbps
307	400	100 erlangs	.2 %	121	9.92 Mbps
308	200	50 erlangs	.2 %	69	5.66 Mbps
309	500	125 erlangs	.2 %	153	12.55 Mbps

Figure 8

Required Equivalent Bandwidth for the Tree Structure in Figure 6.

Note: The value for column (c) is obtained from the corresponding values of columns (a) and (b) using the Erlang formula.





**Figure 9**  
Graphic Representation of the Results in Figure 8.

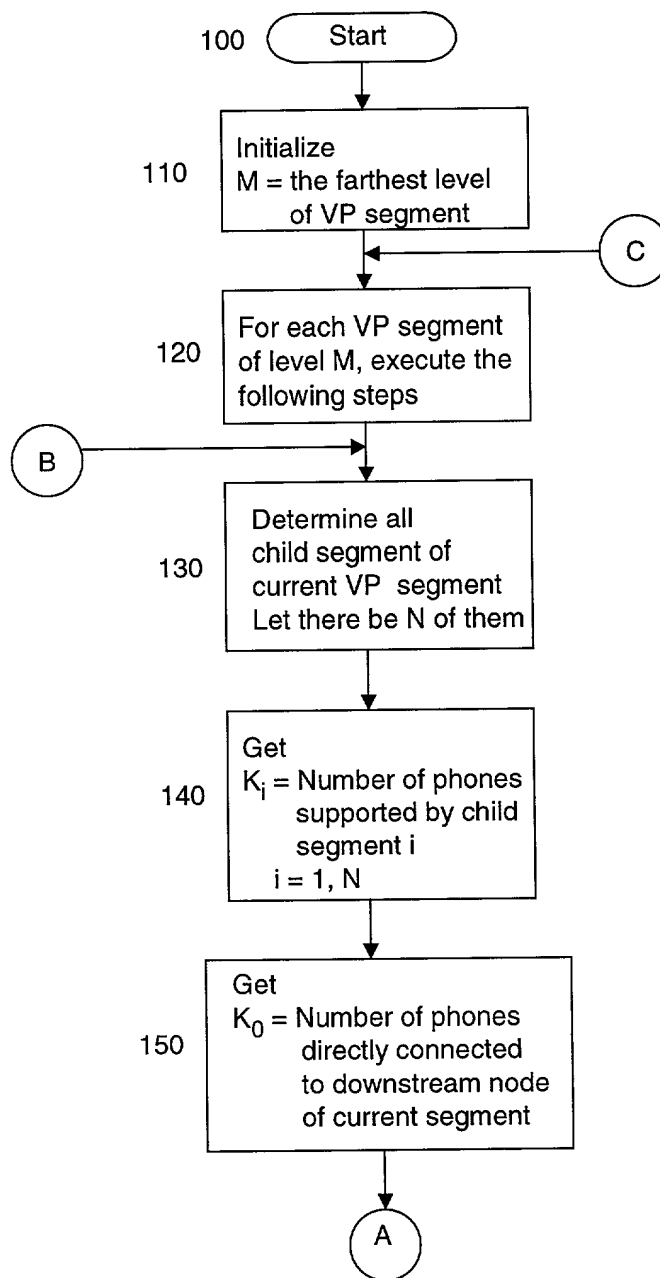


Figure 10A

Flowchart of the Computation of  
Number of Telephones Supported by the Segments

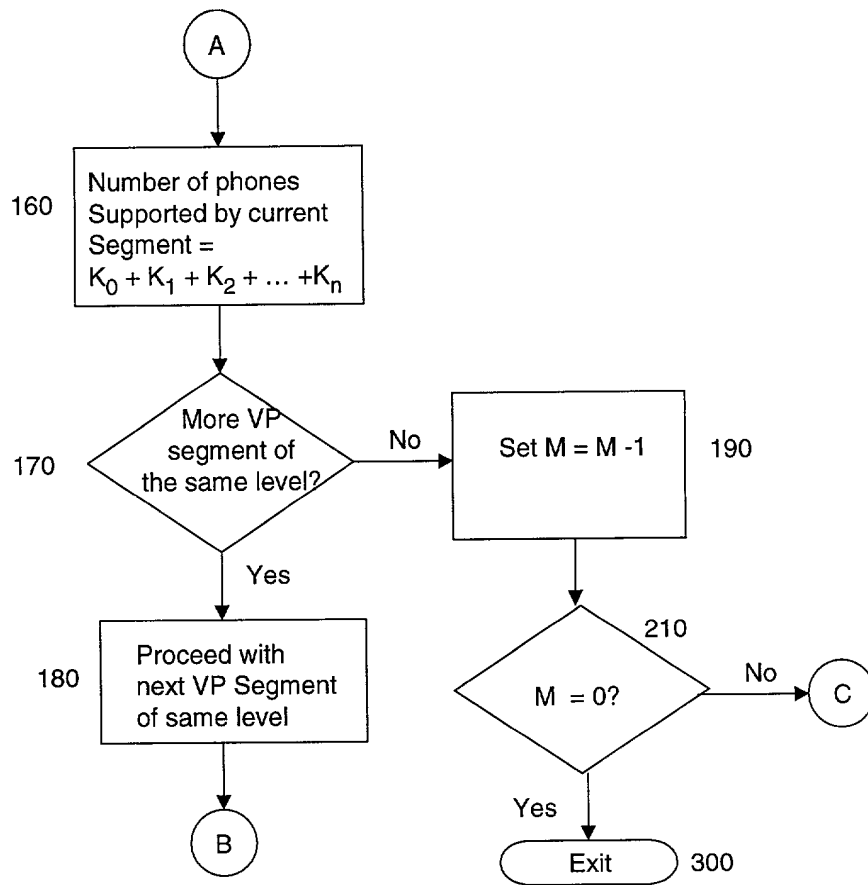


Figure 10B

Continuation of Figure 10A

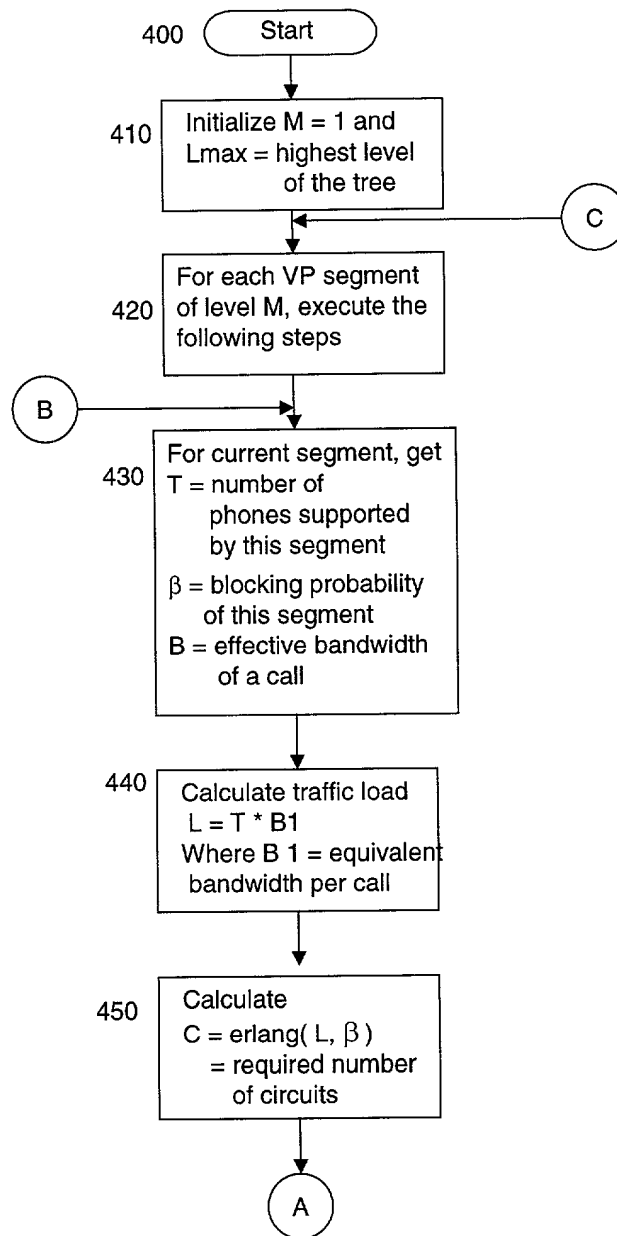


Figure 11A

Flowchart of the Computation of  
the Required Equivalent Bandwidth for the Segments

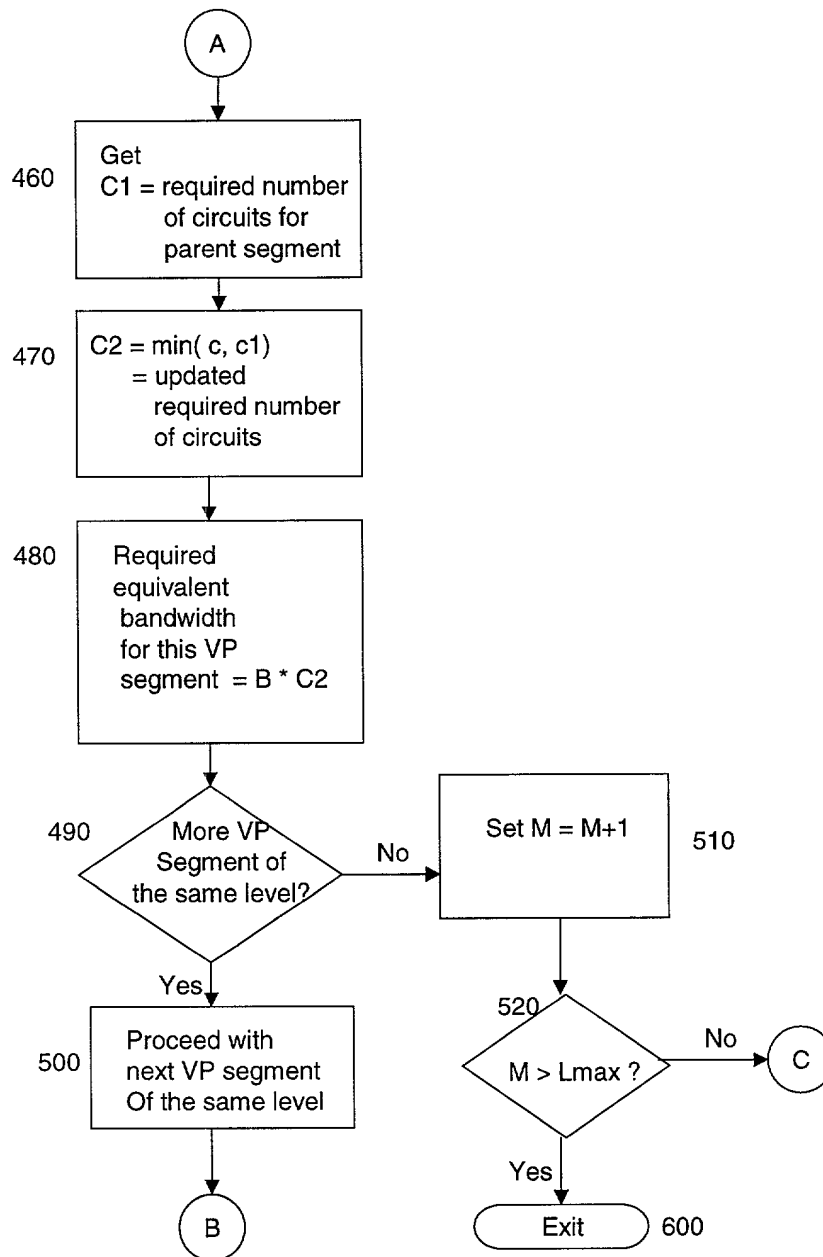


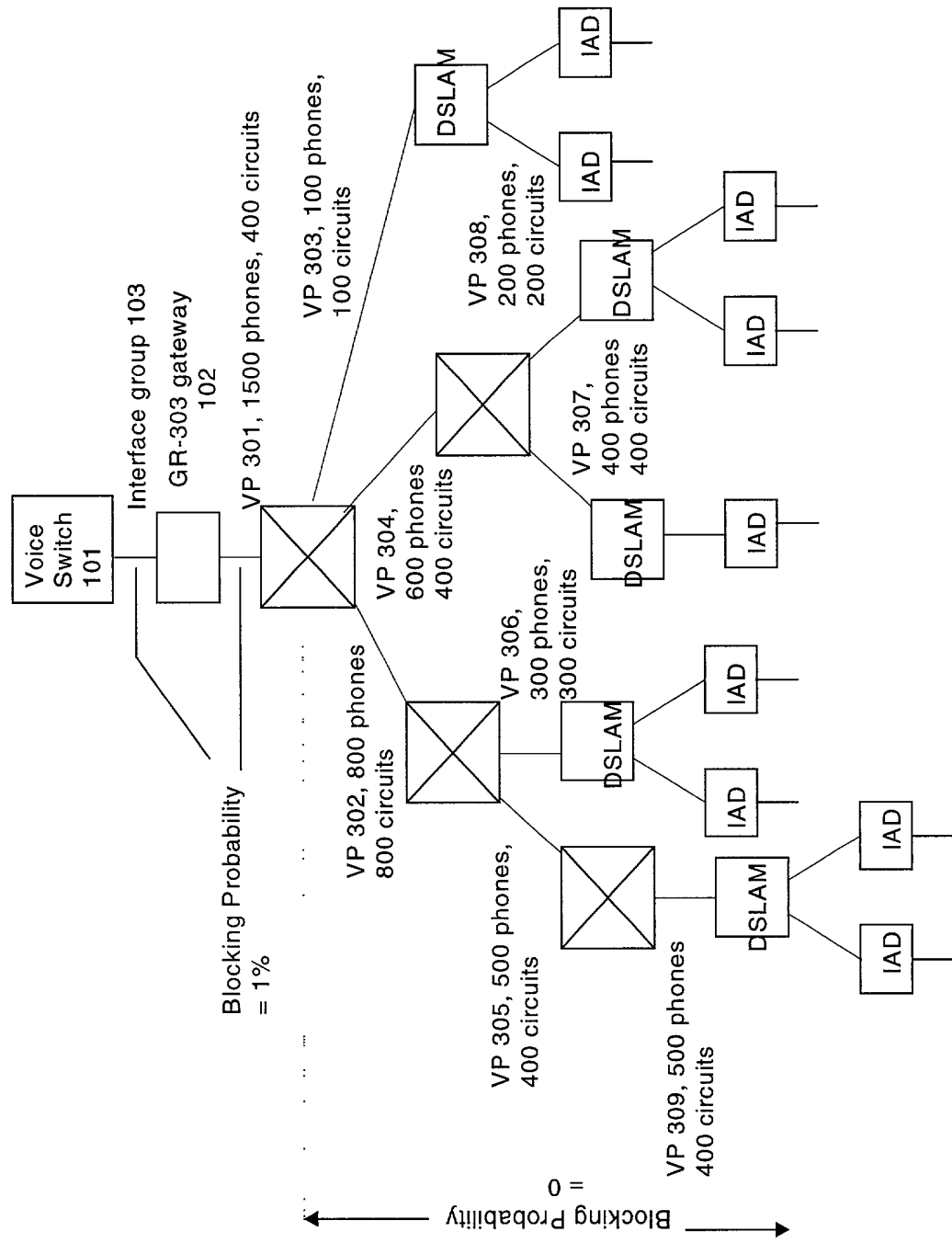
Figure 11B

Continuation of Figure 11A

VP segment	Number of Phones	Blocking Probability	Number of circuits from Erlang Calculation (a)	Number of circuits of Parent VP (b)	Updated Number of required Circuits Minimum of (a) and (b)
301	1500	1 %	400	NA	400
302	800	0 %	800	301	400
303	100	0 %	100	301	100
304	600	0 %	600	301	400
305	500	0 %	500	302	400
306	300	0 %	300	302	300
307	400	0 %	400	304	400
308	200	0 %	200	304	200
309	500	0 %	500	305	400

Figure 12

Number of Required Circuit where Blocking Probabilities for All Level 2 and Above Segments Are 0.



**Figure 13**

Graphic Representation of the Results in Figure 12.

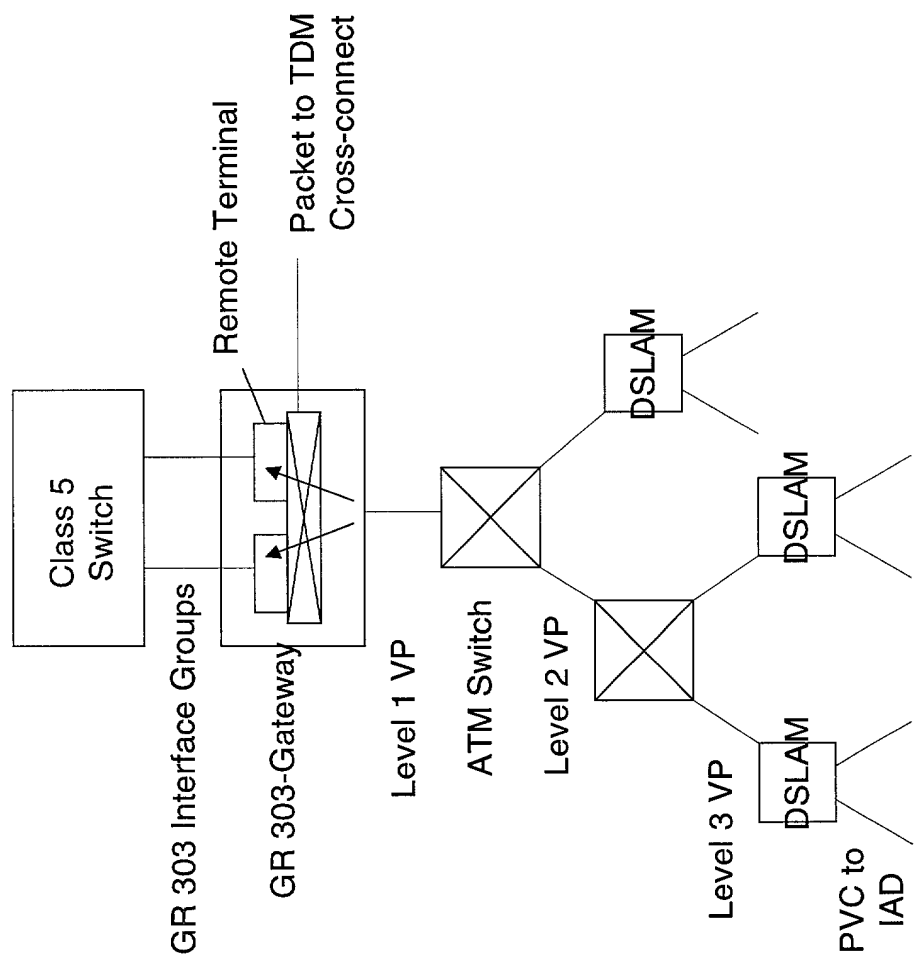


Figure 14

Tree Structure for DSL Access to Class 5 Switch via GR-303 Gateway.

Note: Telephones from the same IAD can be connected to different RT in the gateway.



VP Seg- ment	Blocking Proba- bility	Group 1 (80%)		Group 2 (20%)		Total number of circuits	Effective Bandwidth (in Mbps)
		Number of phones	Number of circuits	Number of phones	Number of circuits		
301	1 %	1200	330	300	91	421	34.52
302	.5 %	640	185	160	55	240	20.40
303	.5 %	80	99	20	12	111	9.10
304	.5 %	480	143	120	44	187	15.33
305	.2 %	400	125	100	38	163	13.37
306	.2 %	240	81	60	27	108	8.87
307	.2 %	320	103	80	33	136	11.15
308	.2 %	160	58	40	20	78	6.40
309	.2 %	400	125	100	40	165	13.53

Figure 15

Effective Bandwidth where Phones from an IAD are Connected to Two Different RTs.

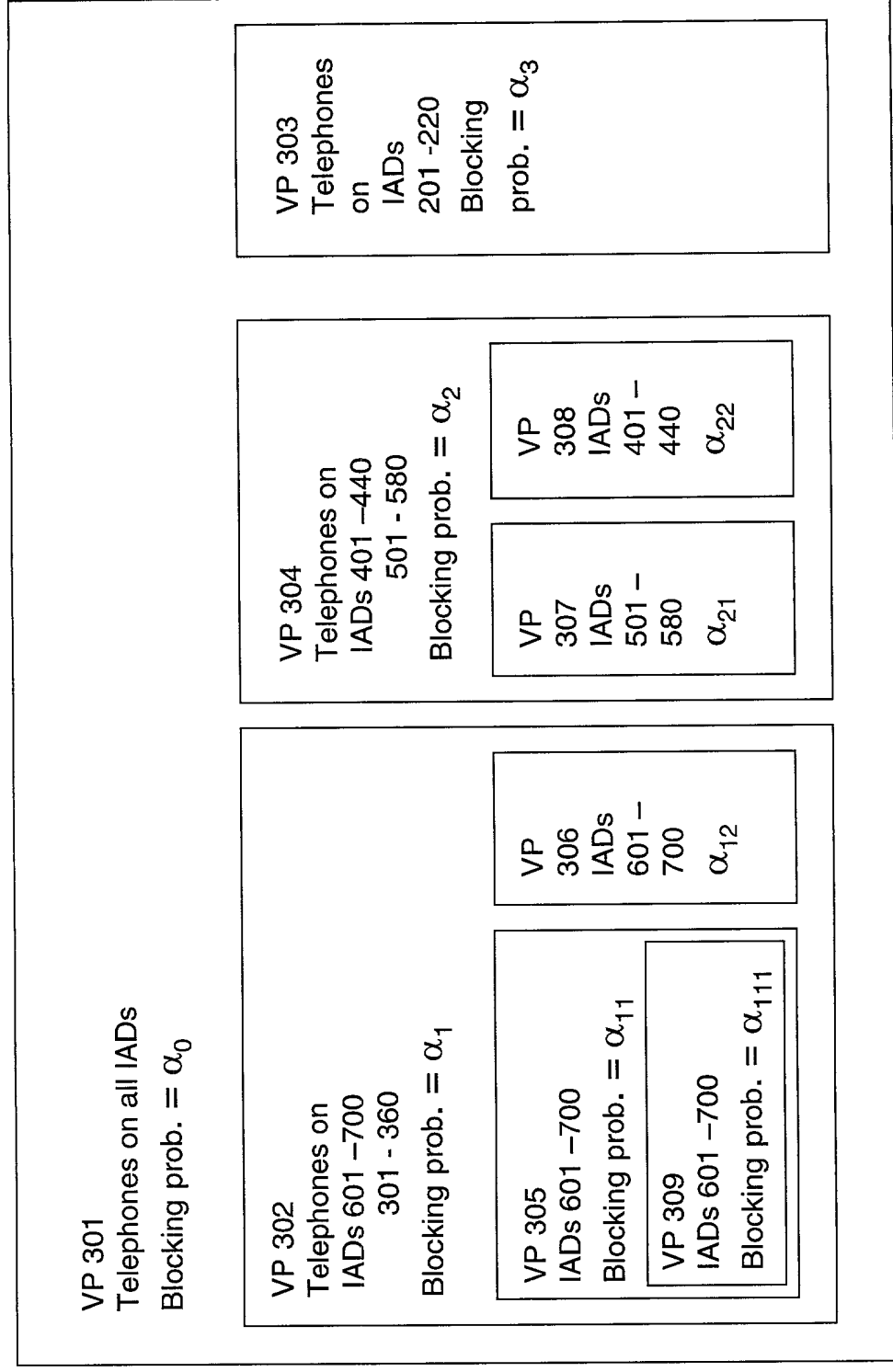


Figure 16

Information Structure of a Voice Switch to Support Hierarchical  
Call Blocking for the Tree Structure in Figure 5.